

VI. Contributions to a Knowledge of North American Moths

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DUMERIL, in 1823, and afterwards Boisduval, in 1836, availed themselves of the structural feature offered by the different antennal forms in the Lepidoptera to establish ideal divisions, higher than Families, in the sub-order. Although not so strongly insisted upon, other considerations may have suggested themselves, apparently justifying a separation of the Butterflies from the rest of the Lepidoptera. But, as we become acquainted with the sub-order, the peculiarities of the Butterflies lessen by comparison. And since the form of the antennae is nowhere absolute, and even in reality will not always separate the Butterflies from many Moths, and since the divisions proposed by Dr. Boisduval are evidently of unequal value, and the character on which they rest of little systematic weight, the terms cannot be retained. Boisduval's terms are in part synchronous with Duméril's, which, in case of acceptance of the values intended, should be preferred. The comparatively persistent character of the clavate antennae in the Butterflies is noticed by Hübner in 1816. But it is evident that the Hesperidae, for instance, present a modification of the form of the antenna as we find it in the higher Butterflies, and are accordingly not to be indifferently classed with them. It would seem as though the succession of Family groups in the Lepidoptera is not to be disturbed by higher exact division, nor need we employ other terms than our common ones for general purposes of designation.

Professor Agassiz, in 1849, records a character which had been before unnoticed by the classifiers of the sub-order. Agassiz calls attention to the fact, that there is a common position of the

wing in all the Lepidoptera in the pupa state. The wings are then bent downwards, and the upper wings cover the lower ones, the upper surface of the latter turned sidewise. In the Papilionidae, or true Butterflies, in their adult state, the wings are raised above the body, their upper surface turned upwards and inwards, never turning outwards. In the mature Hesperian the position of the wings is different; the anterior pair only are raised, while the lower ones are stretched horizontally. In the perfect state of the lowest Moths, the wings are stretched backwards close to the body, which they more or less surround. In the varying attitude of the wings we evidently have a manifestation of the cephalic principle, and accordingly a safe basis upon which to found our systematic arrangements.

It is with diffidence that I suggest that, in the position of the wings, we have a character which might be interpreted as assigning a higher position to the Geometridae. In most of these moths there is a more frequent common ornamentation of the upper surface of the wings, perhaps predicated by the exposure of the hind pair in a state of rest to the light.

With regard to the position of the Deltoids, Lederer says:

“Ich konnte, wie gesagt, ebenfalls keine [Verschiedenheit] auffinden und trage um so weniger Bedenken, die nun aufzuführenden Arten [Deltoiden] zu den Eulen zu rechnen, als sie selbst dann, wenn noch ein sie von diesen trennendes, ausschliessliches Merkmal aufgefunden werden sollte dennoch hier und nicht bei den *Pyraliden* unterzubringen wären und der Totaleindruck sie gewiss von diesen noch weit mehr, als von den *Noctuinen* unterscheidet, überhaupt weniger in Wirklichkeit als in der Gewohnheit diese Arten als *Pyraliden* zu betrachten, besteht.”

While I am not agreed with the separation of the Cymatophorina, *Herrich-Schaeffer*, as a group equivalent to the Noctuidae, nor as having more than analogies with the Bombycidae, I think we shall be justified in considering the Deltoids as belonging to the Noctuidae; and this rather than allow an interpolation of the Family Geometridae between groups so nearly allied, that certain of our first authorities, Zeller, Lederer and Herrich-Schaeffer, cannot separate them by any tangible character.

An idea that the affinities in the Lepidoptera are net-like and not, as they seem to me, branch-like, has excused the classification, especially of the Bombycidae, adopted by v. Heineman and Staudinger, by which Subfamily groups are accorded Family rank, and so incongruous a sequence is adopted, that this would seem the end sought, rather than a natural arrangement of the Moths. No or little allowance is made for comparative characters, and the severity of the generic classification has permitted no adequate comprehension of these softer zoölogical forms. We miss any reference to American genera (without which perhaps no true limitation can be decided upon), either as illustrated by American writers or by the pens of European authors who have investigated so largely the Lepidopterous Faunae of other continents. v. Heineman establishes the European genus *Scodra*, without reference to Guenée's *Leptina*, from America, which it seems should have been compared.¹ On the other hand Packard, in 1864, has indicated in several cases the comparative generic position of European Bombycidae, and, in 1865, we have drawn attention to relationships between the Sphingidae of either continent, and in particular to the position which the European *Macrosila convolvuli* and *Sphinx ligustri* occupy with regard to the American species of the two genera.

I give here a catalogue of our North American species referable to Herrich-Schaeffer's Family *Cymatophorina*, for which I prefer Boisduval's earlier term, and regard them as forming a sub-family of the Noctuidae. Alone of any of the divisions of the family heretofore proposed, they possess a distinctive structural feature, found in the course of the costal nervure of the secondaries.

¹ Auf Seite 17, v. Heineman's Schmetterlinge Deutschlands und der Schweiz, steht, Z. 9, v. unten, "bei der Hesperiangattung *Cyclopaedes* die Hinterschienen auch mit Mittelsporen." Schlägt man, Seite 115, d. Gattung auf, so findet sich gerade des Gegentheils angegeben: "Hinterschienen nur mit Endsporen."

Family, NOCTUIDAE.

Subfamily, **NOCTUO-BOMBYCINI**, *Boisduval* (1829).Tribe, **VERAE**, *Grote* (1863).**CYMATOPHORA**, *Treitschke* (1824).Type: *Noctua flavicornis*, *Linnaeus*.**caniplaga**, *Walker*.² —

Canada (Auth. Walker).

LEPTINA, *Guenée* (1852).Type: *Leptina dormitans*, *Guenée*.**dormitans**, *Guenée*.

New York; Pennsylvania.

latebricola, *Grote*.

New Jersey.

ophthalmica, *Guenée*.

New York; Pennsylvania; Alabama.

Doubledayi, *Guenée*.

Massachusetts; New York; Pennsylvania.

formosa, *Grote*.

Massachusetts.

Tribe, **FALSAE**, *Grote* (1863).**PSEUDOTHYATIRA**, *Grote* (1864).Type: *Thyatira cymatophoroides*, *Guenée*.**cymatophoroides**, *Grote*.♂ *Thyatira cymatophoroides*, *Guenée*.

New York; New Jersey; Pennsylvania.

expultrix, *Grote*.♀ *Thyatira cymatophoroides*, *Guenée*.

Canada; New York; Pennsylvania.

² Mr. Walker's *Cymatophora viridescens* is erroneously determined generically, and I retain the present species with hesitation on the list.

HABROSYNE, Hübner (1816).Type : *Noctua derasa*, *Linnaeus*.**scripta**.*Thyatira scripta*, Gosse.*Thyatira abrassa*, Guenée.

Canada ; New York ; Pennsylvania ; Virginia.

THYATIRA, Ochsenheimer (1816).Type : *Noctua Batis*, *Linnaeus*.**pudens**, *Guenée*.

New York ; Pennsylvania.

The tribes I have adopted in the Moths are founded upon a more intimate resemblance among groups of genera ; they may possibly assist us in placing the different forms into a natural position.

Dr. Packard has shown the existence of two Subfamily types in the Noctuidae, corresponding in the main with M. Guenée's Trifidae and Quadrifidae, but based on other and comparative characters. Lederer had previously shown that M. Guenée's definitions are inexact, and had contended that the Noctuidae are not susceptible of any Subfamily division.

The species thrown together under *Acronycta* appear susceptible of generic division, while our knowledge of the difficult forms is as yet extremely defective. The early stages must be studied, since we find the statements of authors that these differ widely in otherwise closely allied species. I here indicate, I fear imperfectly, the different groups into which it seems our species may be divided, not changing the general generic designation, and leaving many questions for the moment unsolved.

In 1868 we recorded our opinion of Mr. Walker's description of American Moths, based upon our personal examination of the British Museum collections. So many authorities concur in an unfavorable opinion of Mr. Walker's labors, that we need no excuse for omitting here any reference to the British Museum Catalogue, except where we have identified Mr. Walker's descriptions.

Subfamily **NOCTUINAE**, *Packard*.Tribe, **BOMBYCOIDES** (*Hübner*).**ACRONYCTA**, *Ochsenheimer* (1816).

§

vinnula, *Grote*.

New York; New Jersey; Pennsylvania.

§ *Triaena*, *Hübner* (1816).Type: *Noctua psi*, *Linnaeus*.**grisea**, *Walker*.³*Noctua grisea*, Barnston MS.

Hudson's Bay Territory.

Tritona, *Guenée*.*Triaena Tritona*, *Hübner*.

Canada; New York; Pennsylvania.

occidentalis, *Grote and Robinson*.*Acronycta psi*, ‡ *Guenée* (in part, B).

Canada; Massachusetts; New York; Pennsylvania.

telum, *Guenée*.

New York.

morula, *Grote and Robinson*.

Canada, New York.

Lobeliae, *Guenée*.

Canada; New York; Pennsylvania.

fureifera, *Guenée*. —Amérique Septentrionale (auth. *Guenée*).**hasta**, *Guenée*. —Amérique Septentrionale (auth. *Guenée*).**interrupta**, *Guenée*.⁴ —

Georgia (described from Abbot's drawings).

³ This species differs from *Tritona* in the whitish secondaries, but otherwise closely resembles *Hübner's* species. I have examined the types in the British Museum.

⁴ From the manner of remark on page 121 of the Second Report on the Insects of Missouri, it would be inferred this species had been identified. I do not think it can be readily known from the existing description.

spinigera, *Guenée*.

New York; Pennsylvania.

connecta, *Grote*.⁵

New York.

§

funeralis, *Grote and Robinson*.

Canada; Ohio.

§

innotata, *Guenée*.

Diphthera Graefii, *Grote*.

New York; Pennsylvania.

§ *Acronycta*, *Hübner*, restr. (1816).

Type: *Noctua leporina*, *Linnaeus*.

Lupini,⁶ *Behr*.

California.

Iepusculina, *Guenée*.

Acronycta populi, 2d Missouri Report.

Pennsylvania; Missouri.

insita, *Walker*.

New York. *Spec. distinct.?*

§ *Megacronycta*,⁷ *Grote* (1873).

Type: *Acronycta hastulifera*, *Guenée*.

hastulifera, *Guenée*.

Phalaena hastulifera, *Abbot and Smith*.

Apatela americana, *Harris*.

Canada; Pennsylvania; Massachusetts; Southern States.

⁵ *Acronycta connecta*, n. s., ♂, is the narrowest winged species known to me. The body is rather long and stout. Hoary gray, with a testaceous tinge, the markings indistinct. The wing is darker clouded centrally and above internal margin between the basal and internal black dashes. The costal marks are very faint. The orbicular is a void, rather small annulet, and its more whitish hue contrasts. The reniform is also rather small, distinctly ringed inwardly where it is stained, incompletely margined outwardly where it is whitish. The t. p. line is well removed to the external margin superiorly. A dark shade, not a streak, opposite the cell. Terminal elongate interspaceal black streaks. Hind wings whitish with darker clouded borders. Beneath dusted, with faint dot and line.

Expanse, 1.25 inch. Sharon Springs, from O. Meske.

⁶ I have a single specimen of this species that I refer to this section. Compact, stout-bodied, and thickly scaled; primaries narrow without saggitate marks, median shade distinct, t. p. line continuous with succeeding gray shade, fringes minutely black dotted; secondaries with immaculate fringes. The specimen is obscurely colored, perhaps stained; size of *leporina*.

⁷ Gr.: *μέγας* et *Acronycta*. In this section vein 5, is hardly weaker, and the cell is in part closed by a veinlet as strong as vein 5. The fore tibiae are somewhat thickened. I do not think the species belongs to Stephens' genus *Apatela*, of which we appear to have a wrong idea

§ *Apoteia*, *Ochsenheimer* (1816).

Type: *Noctua aceris*, *Linnaeus*.

acericola, *Guenée*. —

Phalaena aceris ‡ *Abbott and Smith, non alior.*

“Georgia.” *An. spec. sequent.* ?

rubricoma, *Guenée*.

New York; Pennsylvania.

luteicoma, *Grote and Robinson*

New York; Pennsylvania.

§

brumosa, *Guenée*. —

Amérique Septentrionale (auth. *Guenée*).

Verrilli, *Grote and Robinson*.

Massachusetts; New York.

noctivaga, *Grote*.

New York; Pennsylvania.

superans, *Guenée*.

Canada; New York.

afflieta, *Grote*.

Texas; Pennsylvania.

longa, *Guenée*. —

Amérique du Nord (auth. *Guenée*).

§

clarescens, *Guenée*.

New York.

§ *Lepitoreuma*,⁸ *Grote*.

Type: *Acronycta ovata*, *Grote*.

ovata,⁹ *Grote*.

Pennsylvania.

from Harris' determination. Harris seems to have confused the two illustrations of Abbot, and while he describes our largest species, which is most probably *hastulifera* of the *Insects of Georgia*, he states it to be figured by Abbot and Smith as *aceris*, which it certainly is not. Harris may have been led to this by larval observations, which perhaps cannot always be considered as correctly made by Abbot. In two instances—*Phalaena angulosa*, Plate 83, and *Phalaena amasia*, Plate 90—I have shown that Abbot has represented two distinct species on one plate as from the same larva.

⁸ Gr.: *λέπις* et *τόρευμα*. This section is characterized by the ovate primaries, which broaden outwardly; the costal edge is produced at the shoulder, depressed centrally and is again full toward the apices. The scales are strongly raised in ridges along the transverse lines.

⁹ *Acronycta ovata*, n. s., Plate 2, fig. 14 ♂, is of the general shape of *Hamamelis*, but very different in color and with distinct sagittate marks. Gray with a bright tinge, shaded with

Hamamelis, Guenée.

New York; Pennsylvania.

dissecta, Grote and Robinson.

Massachusetts; New York.

§

sperata,¹⁰ *Grote.*

New York; Pennsylvania.

§

xylinoides,¹¹ *Guenée.*

New York; Pennsylvania; Missouri.

§ *Eulonche*,¹² *Grote* (1873).Type: *Acronycta oblinita, Guenée.**oblinita, Guenée.**Phalaena oblinita*, Abbot and Smith.

Canada; New York; Pennsylvania; Southern States.

testaceous. A black basal dash extends to the twice strongly angulated t. a. line, which is geminate, the inner more distinct line composed of raised scales. Above the basal dash the humeral space is pale beyond the geminate basal half-line. Median space wide superiorly, owing to the superior wide projection of the distinct and regularly denticulated t. p. line. Orbicular rather large, pale and vague, with clouded center. Costal black marks evident. Median shade apparent by raised darker scales. Reniform vague, bisannulate, stained with deep testaceous. A very narrow black distinct dash at internal angle, broken at the pale continued s. t. line. A third black dash, indicated within s. t. line, opposite the disc. Secondaries fuscous, with the distinct black discal spot and dentate line of the paler under-surface reflected.

Expanse, 1.45 inch. Coll. Am. Ent. Soc.

¹⁰ *Acronycta sperata*, n. s., Plate 2, fig. 1 ♂, belongs apparently to the section of *A. myricae*, *Guenée*. Clear blue-gray, the usual markings of the primaries distinct and erect. T. a. line geminate, waved, component lines divaricate. Orbicular small, very distinct, a blackish void annulet. Reniform well sized, also distinctly but less completely black ringed, crossed by the median shade. T. p. line regularly dentate, nearly straight, as usual inflected below median nervure. No sagittate marks; s. t. line pale, vague; a series of minute terminal black marks. Hind wings white, dusted costally; beneath white, a little dusted, no lines or spots perceivable.

Expanse, 1.35 inch. Coll. B. S. N. S. and Am. Ent. Soc.

¹¹ This species resembles *oblinita* in general appearance, but is easily distinguished by the shape of the primaries, the apices being less produced, the external margin a little straighter. The t. p. line is more distinct and removed further towards the external margin, and there is a more or less obvious streak at internal angle. Perhaps the two are confounded in the Third Annual Missouri Report, p. 71. In this same Report, the re-description of *Laphygma frugiperda*, *Guenée*, the corn-bud-worm moth of Abbot and Smith, as *Prodenia autumnalis*, will at least prevent, it is hoped, "in this country," the appearance of scientific descriptions of this variable species "based upon the simple examination of solitary specimens of the perfect insect, without the fact being mentioned." The italics are mine, and the quotations from page 56 of the Third Report. The species alluded to in this Report as "*Prodenia commcinae*," can certainly not be Abbot and Smith's *Commelinae*, as this is so large as not to be possibly confounded with *Laphygma frugiperda*.

¹² Gr.: "Ἐν τῷ Δόγγῳ. This section is characterized by the long pointed primaries and sunken head. Vein 5 of the hind wings is a mere fold, and the cell open.

insolita,¹³ Grote.

Pennsylvania.

✓ *Agrotis pitychrous*, Grote, Plate 2, fig. 11, ♂.

Allied to *Agrotis quadridentata* and *Agrotis cicatricosa* G. & R., from Colorado Territory and to the Russian *A. acuminifera* Eversmann, as figured by Herrich-Schaeffer.

Pale grayish white from the base along costal region to the transverse posterior line which is indicated by dark dots. The costal edge is marked, showing the inception of the transverse lines which are not perceptible. The orbicular and reniform are rather large, grayish white, with more or less complete black annuli, lying on the dusky discal field that, in the male, shows a testaceous tint. The claviform mark is black and perceivable in its usual place without the transverse anterior line, the latter fragmentary. The extra basal line is geminate, even, and only discontinued at the whitish costal shade. Median vein whitish and the whitish scales extend along veins three and four to the subterminal line which is exerted at this place. Subterminal space whitish, showing black, more or less evident, cuneiform marks before the line. Terminal space dusky, constricted medially owing to the exerted portion of the subterminal line. Interspaceal blackish cuneiform marks take the place of the terminal line. Fringes stained with testaceous. The hind wings are whitish with diffuse dusky borders in the male, while in the opposite sex they are nearly wholly blackish, contrasting with the white fringes and offering a distinctional character when compared with allied species; a faint discal liture in both sexes. Beneath whitish, with dusky shadings; no transverse lines in either sex; a series of interrupted interspaceal terminal dusky marks. Corporal pubescence whitish; collar with distinct dark lines which define also the tegulae. Abdomen whitish, stained with testaceous at the extremity; ovipositor exerted in the female in which the antennae are simple, while these are finely pectinate in the male.

Expanse, 30 m. m. *Habitat*, Long Island, N. Y. (coll. J. A. Lintner).

¹³ *Acronycta insolita*, n. s., ♂, resembles *A. oblinita*, in the lanceolate primary wings, which are even longer and more produced apically. Blackish; orbits of the eyes white. Primaries uniformly blackish, the dark tone obscuring all ornamentation except the t. p. and s. t. lines, which are oblique and appear as rather broad interspaceal lunulated or squared gray marks, which, in the as usual flexed t. p. line, are marked by black outward points, the fragments of the t. p. line itself, the gray marks being the preceding shade. Hind wings white beneath, with the costal region dusted with blackish scales. Palpi with the second joint outwardly black; fore tibiae with blackish longer hair. Abdomen whitish above, darker beneath, rather long. The unusually dark color and pointed wings, together with the peculiar appearance of the transverse lines, should make this species very recognizable. This last section of the genus reminds us of *Leucania*. My specimen of *A. insolita*, expands 1.60 inch. Coll. Am. Ent. Soc.

Cloantha ramosula, *Guenée*, Plate 2, fig. 16, primary wing.

Guenée's figure of this species is not recognisable. In the description this species is compared with the type of the genus, the European *C. perspicillaris*. I believe I describe and illustrate here Guenée's *ramosula*, although the description in the *Spécies Général* is not full and appears to me contradictory in slight points. Cinereous, shaded with ochrey brown. Costal edge cinereous. Below the s. c. nervure the wing is whitish ashen from the base over the cell and, beyond the reniform, this paler shade extends, outwardly obliquely margined, to apex. Orbicular extremely indistinct, indicated by a fragmentary obliquely placed black ringlet. Reniform prominent, large, indistinctly closed outwardly, with an interior brown shade and with its annulus very distinct and black inwardly and inferiorly where it descends below vein 3 and is here surrounded by the diffuse brown shade which extends largely over the median nervules. This black marginal line of the reniform does not enclose the spot but, followed by an inner pale shade, runs upwardly to vein 5, beyond the cell, and is continued straightly outwardly, giving the spot an uncinat appearance or that of a mark of interrogation. T. p. line nearly lost, indicated by little points, visible against the cinereous costal shading. A black streak below m. nervure at the base of the wing. A series of black interspaceal subterminal dashes and whitish dentated shades border the veins terminally, becoming pointed at the fringes which they interrupt with pale dots. Beneath, pale, powdered with carneous, with faint discal dots and diffuse but little darker borders in the male, hardly expressed on the paler hind wing. *No distinct common subterminal line*. Hind wings above testaceous fuscous, with broad diffuse darker borders and reduced dot. Thorax cinereous, with an attenuate median and an upper marginal line on the collar. Guenée says: "Une seule ligne noire, fine, sur le collier."

Expanse, 32 to 35 m. m. *Habitat*, New York; Pennsylvania.

The sexes do not, perhaps, differ, but there is a variation in the distinctness of the marginal shades on the fore wings.

The species described below are to be distinguished at once from our only one hitherto noticed, by the shape of the reniform spot which is, so to speak, reversed in appearance, has not the outward inferior prolongation but an upward and inward V-shaped extension. Beneath there is less carneous shading, no or little trace of bordering bands, but a single continued finely undulate subterminal line crosses both pair of wings and is emphasized on the veins by darker dots.

Cloantha evicta, Grote, Plate 2, fig. 18, primary wing.

♂.—Color of the preceding but without the brown shading over m. nervules or the paler subcostal shade. More uniformly gray, shaded with pale testaceous brownish, with all the transverse markings more distinct. The geminate transverse posterior line is well expressed by a subcontinuous inner dark line and a succeeding pale shade. The veins are picked out by dark scales. A basal whitish subcostal fleck and black submedian streak. Ordinary lines marked on costal edge. T. a. line discernible, outwardly oblique, approximating to t. p. line toward internal margin. Reniform testaceous with faint marginal line, with an upward and inward extension which may be the fusion of the orbicular but which gives the appearance of a large compound spot notched superiorly. Terminal space testaceous brownish, interrupted by longitudinal pale dashes on either side of vein 3. A terminal dark line forming interspaceal cuneiform marks. Secondaries much as in *ramosula*; the veins are marked with darker scales and the common line of the under-surface is here reflected. Beneath whitish gray of a warm tint, powdered sparsely with dark scales; no borders but distinct discal dots and finely dentate continued subterminal line on both wings. Collar whitish gray, without middle line, but with an upper marginal distinct black line which separates the darker discolorous tegulae.

Expanse, 32 m. m. *Habitat*, New York State.

In both this and the succeeding species the head is larger, the eyes more prominent, and the palpi longer than in *C. ramosula*.

Cloantha vomerina, Grote, Plate 2, fig. 17, primary wing.

♂.—This is best described comparatively. There are no traces, or these are but extremely illegible, of the transverse lines; their absence gives the fore wings a resemblance to those of *C. ramosula*. The reniform spot is shaped as in *C. evicta*, but very distinct, owing to its being distinctly black margined. The whitish sub-costal fleck of *C. evicta* is here more diffuse and extended and touches the shoulder of the thorax. A heavy diffuse brown black shade extends over all the inferior portion of the wing, outwardly running obliquely upwardly to apex and covering terminal space. White linear shadings along veins 3 and 4 on terminal space, and thus a tendency to have these pale shadings accompany all the nervules is exposed, but in both the new species these shadings run *parallel* with the veins. Collar pale without median line but with an upper marginal line against the blackish tegulae. On the front, before the antennal insertion, I notice a gathering of the scales into two slight lateral black tufts, not apparent in *C. evicta*. Beneath much as in *C. evicta*; the palpi outwardly are blackish.

Expanse, 36 m. m. *Habitat*, New York State.

Appears to be a larger species than the others, and at first sight to differ strongly. It is, however, very nearly allied to *C. evicta*, but I know of no parallel in the genus that would excuse the reference of both under one name.

***Litognatha*,¹⁴ n. g.**

Ocelli. Head with the scales extended tuftedly forwards on the vertex between the antennae. Male antennae with strongly setose pectinations as well as bristles on either side of the antennal stem; along the basal third the pectinations are reduced, and subobsolete on the inside, somewhat gradually becoming more apparent towards a point about one third from the base, where they seem to be massed, giving the stem a tufted or thickened appearance at this point; thus the antennae differ from the simply bristled structure presented in *Pityolita*. Labial pulpi very long and compressed with appressed squamation. Second joint nearly as long as in *Philometra*, but more bent; third joint very long, about half as long as the second. Male fore legs with slender curved tibiae and a sparse brush of long hair. [The appearance of the fore legs reminds me of the representation by Poey of *Mastigophora*.] Abdomen linear, notably long, exceeding the hind wings by about a fourth of its length. Female antennae simple, the setal hairs obsolete over the basal portion of the stem, impectinate, without nodosity; palpi a little shorter and more curved than in the opposite sex.

One of the genera allied to *Zanclognatha*. In the type, *L. nubilifascia*, the form of the transverse posterior line is unusual. Both the species I here include are slight and *L. litophora* reminds me strongly of *Pityolita* in ornamentation, but may be readily separated on structural characters. As yet I have been unable to make neurational examinations.

***Litognatha nubilifascia*, Grote, Plate 2, Fig. 3 ♂, ♀ 2.**

Gray dusted with olivaceous, paler than *Pityolita* pedipillalis. Transverse anterior line indistinct. Reniform indicated by dots at extremity of cell. Transverse posterior line oblique, a little uneven, not projected opposite the cell as usual, but very slightly outwardly inflected at costa and preceded by a distinct, diffuse olivaceous shade and marked outwardly by a pale line. Subterminal line equally, and thus unusually distinct, similar to the t. p. line in appearance, less oblique. A narrow, distinct, continued marginal line. Secondaries a little paler than primaries with the outer lines of the primaries

¹⁴ Gr.: *λίτος* et *γράσος*.

here continued. Beneath, with the lines repeated, on secondaries a discal dot. A ♂ primary wing measures 12 m. m. along costa.

Habitat, Philadelphia; Buffalo, Olean, Albany, N. Y. (3629, coll. Lintner).

The imago flies in June and July in company with *Philometra* on low grounds in herbage. Fresh specimens are deeper colored, as the active moth readily loses its scales by attrition.

***Litognatha litophora*, Grote.**

♂ ♀.—Of the usual pale gray color, but powdered with brown scales, not olivaceous, as in *Pityolita* or ochraceous as is more usual in *Zanclognatha*. The transverse posterior line has the same shape as in *Pityolita*, but it is *dark brown*, and is continued with nearly the same distinctness across the secondaries which are concolorous. Subterminal shade faint on both wings. Terminal line very distinct, dark brown, fine and subcontinuous. Fringes soiled with brownish. Beneath, the wings are darker than above. The t. p. line is reproduced with great distinctness across both wings. A primary wing measures 12 m. m. along the costal edge.

Habitat, Philadelphia; Albany (♂, 2535, Lintner legit).

***Meghypena*, n. g.**

Ocelli. Labial palpi very long, as long as the thorax; third joint small, porrected, second very long, a little excavate beneath, projected straightly forwards. Primaries wide, swelled at the shoulder, depressed medially, rising to the acute apices below which the external margin recedes, rising again opposite the median nervules; internal margin straight.

This genus differs from *Macrhypena* in the much longer palpi and acute apices of the primaries. The wings are unusually ample yet proportionate, hence differing from *Plathypena* with its wide secondaries and narrow primaries. The propinquity of the median lines is noticeable. The species are recognisable from the irrorate character of the ornamentation. Beneath, on the secondaries, this is quite noticeable, the discontinued darker streaklets reminding us of some *Geometridae* quite strongly. My material is limited to single specimens of either species.

Meghypena vellifera, *Grote*, plate 2, fig 7 ♀.

The ground color, which obtains over the basal and terminal fields of the fore wings, is pale ochrey, covered with dark strigae as in the Geometrid genus *Endropia*. These marks are visible all along the costa. On the internal margin at extreme base the wing shows a dark shade. The first of the median lines is outwardly acutely projected on the median nervure, below which it runs evenly inwardly to internal margin. Above that point it runs inversely to costa, being inwardly dentate below costal nervure. The median space is purply blackish with the ordinary spots black and distinct. The median lines show accompanying deep brownish shades on the median space that meet centrally below the median nervure. Outer median line even, like the inner line in appearance, bent at median nervure and running inwardly below it to internal margin. Subterminal line consisting of an undulating series of clouded blackish spots tipped outwardly by white scales. A large diffuse brown shade lies on external margin below the apices, obliquely margined superiorly. Terminal line dark, interrupted. Hind wings fuscous, without markings, with a dark subcontinuous terminal line, and with the discal mark and strigae of the nuder-surface reflected; fringes stained with ochreous. A primary wing measures 20 m. m. along the costa.

Habitat, Sharon Springs, N. Y. (O. Meske coll.)

Meghypena lentiginosa, *Grote*.

♂.—Resembles the preceding species strongly in ornamentation but not in color. The primaries are fuscous, but little darker than the secondaries. The median space does not contrast, but dark brown shades line the median lines and extend centrally below the median nervure as in *M. velifera*. The ordinary spots have the same representation. None of the usual markings contrast on the primaries in this duller-hued species which seems to exceed *M. velifera* in size, while agreeing with it in the details of the ornamentation, and especially that, on the fore wings beneath, the simple more prominent black dot followed by whitish scales, below the costa, and which inaugurates the obsolete subterminal line, is quite evident. Bearing in mind the variability of *Zanclognatha laevigata*, *Grote*, and *Renia discoloralis*, *Guenée*, the union of the two species I here declare seems probable, and yet the effect produced on my mind by the specimens I have now under consideration, is that of having to do with two distinct species. It seems unlikely that the bright-hued *M. velifera* with the pale ochrey ground color of the primaries should be specifically identical with the sombre-hued *M. lentiginosa*, which recalls in appearance the species of *Macrhypena*. A primary wing of *M. lentiginosa* measures 22 m. m. along the costal region.

Habitat, Albany, N. Y. (2339, coll. Lintner).

Family GEOMETRIDAE.

Fidonia fimetaria, Grote and Robinson.

Fidonia fimetaria, G. & R., Trans. Am. Ent., Soc. Vol. 3, p. 181,
Plate 2, figs. 84-85 ♂, 86 ♀, 1870.

Fidonia halesaria, Zeller, Beitr. z. Kennt. nordam. Nachtfl., erste
Abth. p. 42 (488) 1872.

This species is from Texas, and represents, as we stated, the European *Fidonia fasciolaria* in our Fauna. Our comparative remarks are so accurately repeated in the course of Professor Zeller's full description, that it is to be regretted the Professor had evidently not seen our illustration of the North American species.

I am indebted to Professor Hagen, of Cambridge, for a copy of the first part of Professor Zeller's writings on North American Moths, received by me while engaged on the present article.

Family PYRALIDAE.

Botis unimacula.

Asopia unimacula, G. & R., Trans. Am. Ent. Soc., Vol. 1, p. 14,
Plate 2, fig. 8.

Habitat, Brewsters, N. Y. (coll. C. T. Robinson). I am inclined to refer this species to the present genus, and to place it near *Botis plectilis*, *Grote and Robinson*. I accept Professor Zeller's corrected writing of the generic name.

Botis badipennis, *Grote*, Plate 2, fig. 12 ♀.

♂ ♀.—Palpi rather long and narrow, projected, a little dependent, not projected. Chestnut brown, varying in depth of tint. Ornamentation simple. On the primaries there is a continued blackish slightly arcuate transverse anterior line, distinct, slightly notched before internal margin, and more deeply inwardly on costa where the line is narrower. A large diffuse blackish stain suffuses the discal reniform spot, extending downwards below median nervure.

Transverse posterior line blackish, well removed towards external margin leaving the middle field of the wing wide. It differs by running nearly straightly downwards from its inception which takes place nearer the apices than usual. It is minutely undulate or subdentate to vein 2, below which it is inwardly arcuate, and nearly even to internal margin. A very fine continuous line margins the wing. Fringes concolorous. Secondaries paler, somewhat testaceous, clouded faintly centrally with blackish. A single continued narrow blackish line, continuous with the transverse posterior line of the primaries, crosses the wing. It is minutely undulate and becomes irregularly rivulous inferiorly. The external margin and fringes are more or less stained with light brown, and colored like the fore wings. A similar fine marginal line borders the wing. Body parts concolorous with primaries. Beneath a little paler and duller tinted. A faint discal streak on primaries, none apparent on the hind wings. A common exterior distinct blackish transverse line, which, on the hind wings, is better marked, and not so irregularly rivulous inferiorly as its analogue on the upper surface.

Expanse, 22 to 24 m. *Habitat*, Maine; White Mountains, New Hampshire (coll. Prof. A. S. Packard, Jr.).

***Eurycreon chortalis*, Grote, Plate 5, fig. 13 ♂.**

♂ ♀.—Head with a frontal projection. Palpi short. Fore wings with the costal edge somewhat convex and with the apices depressedly acuminate. Pale testaceous much shaded with gray, varying in depth of tint and distinctness of markings. Fore wings testaceous, dusted with gray. The veins marked with dusky scales colored like the lines. Discal dots and two inner transverse lines difficult to make out. Transverse posterior line evident, acutely dentate on interspaces, continued. Subterminal line similar but more even and equally apparent, becoming a little diffuse at apices. A narrow terminal line. Fringes concolorous, with dark lines, of which the inner is sometimes interrupted. Hind wings white, with a more or less continued and expressed blackish transverse line running at variance with the more distinct diffuse black serrulate subterminal band which widens to apices and becomes narrow and obliterate toward anal angle. The narrow terminal space between this band and the margin is stained with testaceous; a continued terminal line. Fringes whitish outwardly, dark near the wing, with the inner line apparent. Both the apices of the fore and hind wings are, in one specimen, touched with ochreous. Beneath more dusky, but like upper surface, all the markings are repeated, veins dusky; on hind wings there is a discal liture, and the inner transverse line is seen to run inwardly opposite the discal streak. The wings are subopalescent and diaphanous.

Body concolorous ; apparently the caputal squamation is subochreous ; abdomen whitish above, more dusky beneath ; legs dusky inwardly.

Expanse 24 to 26, m. m. *Habitat*, Albany, N. Y. (coll. J. A. Lintner); Mass. in May (coll. Prof. A. S. Packard, Jr.); Alabama (Grote legit.).

Family **TORTRICIDAE.**

Phaecasiophora,¹⁵ n. g.

Differs from any known Tortricidian genus by the structure of the male hind tibiae. In *Penthina* the tibiae have a tuft of hairs lying in a depression on the surface of the joint. In *Phaecasiophora* the joint is covered with long and coarse scales standing out from it and, in *mutabilana*, from their white color, giving the tibiae the appearance of being wrapped in wool or cotton (Plate 2, fig. 6). The form is robust, the abdomen notably long. The palpi are porrect, coarsely scaled, with small third joint. The primaries are rather broad with parallel margins, 12-veined, all the veins separate (Plate 2, fig. 5a). Hind wings 8-veined, cell closed by an aborted veinlet, 3 and 4 from one point, 5 immediately approximate (Plate 2, fig. 5b).

Phaecasiophora mutabilana. Plate 2, fig. 4 ♀, 5 neuration, 6 ♂ hind leg.

Sericoris mutabilana, Clemens, Proc. E. S. Phil., Vol. 5, p. 135 (1865).

♂ ♀.—Variable in color, either wood-brown or of an ochrey reddish tint. Primaries crossed by three darker, broad, bent, sinuously edged bands not attaining internal margin, with paler interspaces medially traversed by darker shade lines. On the middle band at its outer edge, about the extremity of the cell, is an ill defined whitish spot. Between the middle and outer dark bands

¹⁵ Gr.: φακάσιον et φέπα. Kräftig gebaut mit verhältnissmässig langem starkem Hinterleib. Von allen mir bekannten Gattungen dieser Zunft durch die im männlichen Geschlechte grob, lang und herauf beschuppten Hinterschienen verschieden (Tafel 2, fig. 6). Durch die weisse Farbe erscheinen die Hinterschienen bei *mutabilana* ♂ wie mit Wolle umhüllt. Vorderflügel breit mit kaum hervortretender Spitze und Penthinen—artigen Zeichnung, auf dem Mittelfelde ein weisslicher Punkt; 12 Rippen, alle gesondert, 3 und 4 nicht aus einem Punkte entspringend, Theilungs Rippe unvollkommen (Tafel 2, fig. 5a). Hinterflügel mit gleich mässig langen Fransen; 8 Rippen, 3 und 4 aus einem Punkte, 5 gleich dahinter; Theilungs Rippe fadenförmig, aber fortgesetzt (Tafel 2, fig. 5b).

the narrower interspace is Y-shaped towards internal angle, enclosing by the inverted limbs a dark spot. A series of costal ante-apical dark dots. The oblique outer band encloses a paler ill defined space on external margin above the angle. Hind wings dark fuscous with pale fringes. Beneath paler, with the central portion of the fore wings fuscous.

Habitat, New York; Pennsylvania; Virginia.

Phaecessiophora? niveiguttana, Grote. Plate 2, fig. 15 ♀ primary wing.

Although I only know the female of this species, there seems but little doubt that it belongs here, since it agrees in all apparent characters with *mutabilana* ♀. The ornamentation is so similar that it is best described comparatively. Bright ochreous, the darker markings reddish brown. The darker bands are more attenuate, sinuous, defined by blackish scales, distinct. Two blackish streaks at the base of the wing are quite evident, whereas in *mutabilana* there are but faint indications of their presence. The shape of the external margin of the first transverse band is different; it is acutely projected about the subcostal nervure, lunulate beneath. The white discal spot on the middle band is clear, distinct and defined; there is a black dot (on the succeeding pale interspace) which, owing to the outward angulation of the middle band where it encloses the white discal spot, appears above this latter on the costal region. The outer band is like an inverted Y, owing to its narrower shape, and the limbs being more distinctly expressed by the greater extent of the pale spot on external margin above the angle which they enclose. Costal pale and dark dots distinct and evident. Differs notably from *mutabilana* by the presence of two white apical streaks, the one, shorter, before the apex, the other longer, below it and attaining the extremity of the upper limb of the Y-shaped outer band on external margin. Hind wings fuscous. Beneath both pair are pale fuscous, darker than in *mutabilana*, with distinct costal striations.

Habitat, Pennsylvania.

Penthina Blakeana, Robinson, Plate 2, fig. 8, primary wing.

Head and thorax brownish; primaries with a large brown basal patch, much as in *fasciata* (*Clemens*), from which this species differs by the twice broader whitish succeeding interspace which has a faint pink hue, and by its width narrows the median dark brown *oblique* continuous band of the wing which is toothed outwardly at the center. Costal points distinct; the apical darker shading is reduced and limited by a curved shade line. Hind wings fuscous with pale fringes. Fore wings with the fringes tipped with dark scales to about the middle of external margin.

Habitat, Pennsylvania (C. A. Blake).

***Penthina matutina*, Grote, Plate 2, fig. 9, primary wing.**

White. Head and thorax whitish. Primaries whitish with scattered dark scales; basal patch incomplete superiorly about the middle of the wing, with scattered dark costal scales. Middle brownish band continued with distinct edges marked by blackish scales. The succeeding whitish underspace is contracted medially by the more diffuse apical clouding which extends beyond the curved line. Costal marks minute. Beneath fuscous with whitish costal edge and more distinct regularly divaricate dark streaks.

Habitat, Texas (*Belfrage*, ²²/₅).

I have only a single specimen in which the secondaries are defective, but the species is quite distinct from *Blakeana*, which it resembles.

***Penthina toreuta*, Grote, Plate 2, fig. 10, ♂.**

I refer this very distinctly marked and easily distinguished species with some hesitation to the present genus. Uniformly dark silky wood brown. The primaries are crossed centrally by two parallel slightly arcuate livid raised metallic lines. Three costo-apical pale dots supported by metallic drops, the third surmounting the narrower metallic terminal line which is interrupted on submedian interspace; fringes burnished. Under the glass the squamation is seen to consist of dark scales with paler overlying tips. Hind wings fuscous with pale fringes. Beneath paler, silky; fore wings with an ochreous stain, pale costal streaks and a faint even pale terminal shade on the margin followed by a dark hair line.

Habitat, Pennsylvania.

***Grapholitha distema*, Grote.**

A tiny blackish silky species resembling the European *compositella*, but with only two white lines on the internal margin of the primaries. Eight white costal marks disposed in pairs, crowded towards the black apices and becoming straighter and shorter; the first pair more oblique and divaricate. A silvery subterminal streak runs from opposite the cell over the median nervules tapering to internal angle. Secondaries fuscous with pale fringes. Beneath iridescent, greenish in certain lights, with minute white costal dots over the outer half of the wing. Body scales beneath whitish.

Habitat, New York; Pennsylvania.

Family **TINEIDAE.***Oeta gemmata, Grote.*

Among a collection of Lepidoptera received by the American Entomological Society from Professor Poey, of Havana, and which collection has been the subject of several papers¹⁶ in the Proceedings of that Society, is a specimen in excellent conservation, bearing the number 821, and belonging to the genus *Oeta, Grote*. This little moth is of a most brilliant golden orange, and the markings of the fore wings are similar to those of our United States *Oeta compta Clemens* sp. (= *Deiopeia aurea Fitch*, as suggested, probably correctly, by Mr. Stretch). It is one-third smaller than our species. There are, as usual, four bands composed of white dots on a blackish ground, but here the dots are smaller and linear, appearing as interrupted streaks and allowing the darker ground color of the bands to obtain. But the bands themselves are narrower in *O. gemmata*, so that the golden appearance of the wings is much less interrupted than in *O. compta*. The third band is furcate before costa, while the fourth, covering internal angle, is not connected with the outer limb of the apical furecation, as in *O. compta*. The hind wings are smoky hyaline, becoming darker exteriorly. The smoky abdomen has a bluish reflection. The legs, palpi and face are dark with white points. The basal joint of the fore legs is golden outwardly. Altogether, this is a narrower insect than *O. compta*, and very evidently a smaller species. The Cuban specimen expands 23 m. m., while the fore wings at their greatest breadth near the external margin measure 3 millimètres.

Professor Zeller characterizes *Oeta punctella (Cramer)* comparatively with *O. compta*, in the *Stettiner Entomologische Zeitung*, p. 178, 1871. Cramer describes his species from Surinam, while Professor Zeller seems to hesitate to regard his So. American specimens as belonging to a distinct species from our United States *O. compta*.

¹⁶ *Grote*—Notes on the Sphingidae of Cuba, *Proc. E. S. Phil.*, Vol. 5, pp. 33-84, 1865; Notes on the Bombycidae of Cuba, *id.*, pp. 227-255; Notes on the Zygaenidae of Cuba, *id.*, Vol. 6, pp. 173-189, and pp. 297-334, 1866-7; List of the Sphingidae, Aegeriidae, Zygaenidae and Bombycidae of Cuba, *Trans. Am. Ent. Soc.*, Vol. 3, pp. 183-188, October, 1870.

The Professor has not compared Cramer's figure, which seems to me to bear out the Professor's description in having much less yellow and being blacker on the primaries. While Cramer's figure but indifferently recalls *O. compta*, it cannot possibly represent *O. gemmata*. Had Cramer drawn our new Cuban species we might expect a splash of gold color to have represented the fore wings instead of the dark dotted appearance of these in the figure of *O. punctella*, judging from his known rough manner of illustration. But we probably have to do with three species, whereof *O. compta* from North, is a near ally of *O. punctella* from South America, while our insular *O. gemmata* is far prettier, smaller and brighter than either.